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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,655	04/16/2004	Ramon A. Gomez	1875.5200000	8481

26111 7590 12/29/2006

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EXAMINER	
NGUYEN, SIMON	
ART UNIT	**PAPER NUMBER**
2618	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/29/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/825,655	GOMEZ ET AL.	
	Examiner	Art Unit	
	SIMON D. NGUYEN	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 8, 14, 17-19, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otaka (2003/0007377) in view of Molnar et al. (2003/0176177).

Regarding claims 1, Otaka discloses a mixer (figs.10, 13, 14A-B), comprising: an input transistor pair (Q40-43, 48-49) for receiving a baseband signal (RF+-) and a LO signal (LO +,-) ; a plurality of submixers (transistor pairs Q40-41; Q 42-Q43; Q44-Q45; Q 46-Q47) coupled in parallel for mixing the baseband signal and the LO signal; and a tail current source (Io) to supply power; wherein the plurality of submixers share the input transistor pair and the tail current source (paragraphs 78-85, 97-112). However, Otaka does not specifically disclose the mixers having a polarity that can be reversed to get a combining output.

Molnar, in the same field of invention, discloses each mixer having a polarity that can be reversed to obtain a combining output (Molnar discloses the reversed polarity of mixer in order to obtain a combining output, which is inherently to avoid the cancellation of the combining signal output) (paragraphs 26, 34, 99, 130, 247, 258, 263-264, figs. 13, 16). Therefore, it would have been obvious to one skilled in the art at the time the

invention was made to have Otaka, modified by Molnar in order to get a desired combined-signal output.

Regarding claim 2, Otaka further discloses the LO dividing a plurality of individual LO waveforms (paragraphs 31, 34-36, 39, 50, 52, 62, 75, 84, 91-92, 99, 109, 110-112).

Regarding claims 17-18, these claims are rejected for the same reason as set forth in claims 1-2, respectively.

Regarding claim 3, 19, Otaka discloses a phase shift for differing between the waveforms (figs. 10, 13, 14A-B, paragraphs 31, 34-36, 39, 50, 52, 62, 75, 84, 91-92, 99, 109, 110-112). However, Otaka does not specifically teach or suggest a phase difference between any two time-adjacent individual LO waveforms is approximately equal to a phase difference between any other two time-adjacent individual LO waveforms in the plurality of LO waveforms.

Molnar discloses a phase difference between any two time-adjacent individual LO waveforms is approximately equal to a phase difference between any other two time-adjacent individual LO waveforms in the plurality of LO waveforms (figs. 6, 14A, 19A-B, paragraphs 130, 185-195). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Otaka, modified by Molnar in order to prevent the signal interference as well noise.

Regarding claims 8, 14, Molnar discloses a square wave (figs. 11, 14A).

Regarding claim 23, this claim is rejected for the same reason as set forth in claims 1 and 3.

3. Claims 4-7, 9-13, 15-16, 20-22, 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otaka (2003/0007377) in view of Molnar, in view of Kizer (2005/0206416).

Regarding claim 10, Otaka discloses a RF mixer, comprising: inputting an input signal (RF in) to a plurality of sub-mixers (fig.10); driving a switch (SW1, SW2) on each submixer; mixing the input signal with the plurality of individual LO signal (LO+-) in active sub-mixers; summing outputs of each of the plurality of sub-mixers to generate a final output signal (I out) (figs 10). However, Otaka does not specifically disclose that only one of the sub-mixer is active at a time.

Kizer discloses a mixer, comprising: an RF input, LO input, and, a switch on each of the sub-mixers (figs. 4, 7) such that only one submixer is in active at a time (paragraph 58). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have modified Otaka, modified by Kizer to reduce noise that may produce in the mix LO signals in order to improve the performance.

Regarding claims 4-6, 11, 13, 20-21, 24-26, Otaka does not specifically disclose a phase shift of 45 degrees, square root, and the oscillating signals do not overlap.

Kizer discloses a mixer having a phase difference of 45 degrees and the LO waveforms do not overlap (figs.4, 7, 10, paragraphs 78-79, 85, 160), wherein Kizer further discloses more than six submixers (fig.7) and a square root of 2 (paragraph 134). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have modified Otaka, modified by Kizer to reduce noise that may produce in the mix LO signals in order to improve the performance.

Regarding claims 9, 22, Kizer discloses that only one submixer is in active at a time (paragraph 58).

Regarding claim 12, this claims is rejected for the same reason as set forth in claim 3.

Regarding claims15-16, Otaka further discloses the input signal is an RF baseband signal and the out signal is an IF signal (paragraph 109, fig.15). The input signal is an IF signal and the output signal is an RF baseband signal (paragraph 112, fig.15).

Response to Arguments

4. Applicant's arguments with respect to claims 1, 3, 12, 19, 10, 17, and 23 have been considered but are moot in view of the new ground(s) of rejection.

The new cited reference issued to Molnar discloses a sub-mixer having a polarity, wherein the polarity of the sub-mixer reverses or switching to obtain a combined signal output. Since the output of the signal is polarized in order to obtain the combined signal output which means the reversed polarity of the signal to prevent the outputted- signal cancellation.

Furthermore, Molnar also discloses that the adjacent pair of the LO signal is equal to other adjacent pair of the LO signal which is explained by figs. 6, 14A, 19A-B, in which the phase difference of the pair of adjacent PLO0+, PLO0- equal to the pair of adjacent PLO1+, PLO1-.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Simon Nguyen whose telephone number is (571) 272-7894. The examiner can normally be reached on Monday-Friday from 7:00 AM to 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban, can be reached on (571) 272-7899.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 306-0377.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

600 Dulany, Alexandria, VA 22314

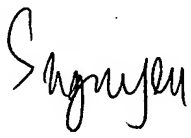
Or faxed to:

(571) 273-8300 (for formal communications intended for entry)

Hand-delivered response should be brought to Customer Service Window located at the Randolph Building, 401 Dulany, Alexandria, VA, 22314.

Simon Nguyen

December 14, 2006



SIMON NGUYEN
PRIMARY EXAMINER